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10/623,540	07/22/2003	William S. Kennedy	015290-661	4866

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EXAMINER
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ZERVIGON, RUDY

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/623,540

Applicant(s)

KENNEDY ET AL.

Examiner

Rudy Zervigon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 August 2005.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.  
4a) Of the above claim(s) 22-25 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-21 and 27-30 is/are rejected.  
7) ☒ Claim(s) 26 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 16 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election of Group I, claims 1-21 in the reply filed on May 12, 2005 is acknowledged.
2. Applicant's amended claims 22-25 remain as method claims restrictable from the elected apparatus claims for the same reason provided by the Examiner in the original restriction of May 2, 2005

### ***Response to Amendment***

3. Applicant's amendment to the specification is entered by the Examiner and does not constitute new matter. See MPEP 2163.06 Section III – *In re Benno* Page 2100-190-191.

### ***Drawings***

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "first member", "second member", "first part", "second part", "third part", "first surface", "second surface" must be shown or the features canceled from the claims. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the

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drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 10-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Independent claim 10 claims elements "first surface", and "seconnd surface". Applicant's disclosure is devoid of such a description. The Examiner cannot make an accurate art-based rejection without claims 10-16 being properly supported by Applicant's specification.

7. Claims 11, 16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claims contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Dependent claim 11 claims a "third part". Applicant's disclosure is devoid of such a description.

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The Examiner cannot make an accurate art-based rejection without claim 11 being properly supported by Applicant's specification.

8. Claims 10-16 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Independent claim 10 claims elements "first surface", and "second surface". Applicant's disclosure is devoid of such a description including Applicant's amendment to the specification which does not provide enablement for "surfaces" other than "top surfaces" 30, 20, 16; Figure 1; "bearing surfaces" 48, 47, 147; Figures 9, 10. The specification amendment of August 15, 2005 fails to enable or give sufficient written description to support what Applicant believes is the claimed invention.

***Claim Rejections - 35 USC § 103***

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. Claims 1-21, and 27-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Barnes; Michael et al. (US 6,818,096 B2) in view of Ishida; Toshimichi et al. (US 5,766,364 A). Barnes teaches a component (Figure 1; column 1, line 55 - column 2, line 58) of a plasma (abstract) processing apparatus, comprising: a first member (7; Figure 1; column 2, lines 34-58) attached to a second member (1,8; Figure 1), the first member (7; Figure 1; column 2, lines 34-58) including a plurality of through apertures (T-shaped hole for 22; Figure 1; column 2, lines 35-58) having a first portion (top portion of through hole for 22; Figure 1; column 2, lines 35-58)

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and a second portion (bottom portion of through hole for 22; Figure 1; column 2, lines 35-58) wider than the first portion (top portion of through hole for 22; Figure 1; column 2, lines 35-58); and a plurality of first fastener members (members between 7 and 22; Figure 1; column 2, lines 35-58) each mounted in an aperture (T-shaped hole for 22; Figure 1; column 2, lines 35-58) of the first member (7; Figure 1; column 2, lines 34-58), each first fastener member (member between 7 and 22; Figure 1; column 2, lines 35-58) including a head (widest portion of 22; Figure 1; column 2, lines 35-58) configured to prevent rotation of the first fastener members (members between 7 and 22; Figure 1; column 2, lines 35-58) relative to the first member (7; Figure 1; column 2, lines 34-58), the head (widest portion of 22; Figure 1; column 2, lines 35-58) having a bearing surface (lowest surface of widest portion of 22; Figure 1; column 2, lines 35-58) facing a surface that at least partially defines the second portion (bottom portion of through hole for 22; Figure 1; column 2, lines 35-58) of the aperture (T-shaped hole for 22; Figure 1; column 2, lines 35-58) - claim 1

Barnes further teaches:

- i. The component (Figure 1; column 1, line 55 - column 2, line 58) of Claim 1, wherein (i) the first fastener members (members between 7 and 22; Figure 1; column 2, lines 35-58) are T-nuts with internal threads, or (ii) the first fastener members (members between 7 and 22; Figure 1; column 2, lines 35-58) comprise a head (top thickest portion of 22; Figure 1) and an externally threaded end portion opposite the head (top thickest portion of 22; Figure 1), as claimed by claim 2. It is inherent that Barnes' bolts have "a head and an externally threaded end portion opposite the head".

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- ii. The component (Figure 1; column 1, line 55 - column 2, line 58) of Claim 1, wherein the surface that at least partially defines the second portion (bottom portion of through hole for 22; Figure 1; column 2, lines 35-58) of the aperture (T-shaped hole for 22; Figure 1; column 2, lines 35-58) is a second bearing surface – claim 3
- iii. first fastener members (members between 7 and 22; Figure 1; column 2, lines 35-58) comprise a rectangular-shaped head (see rectangular shape in Figure 1), as claimed by claim 5
- iv. first fastener members (members between 7 and 22; Figure 1; column 2, lines 35-58) includes a noncircular-shaped head (see rectangular shape in Figure 1), as claimed by claim 6
- v. The component (Figure 1; column 1, line 55 - column 2, line 58) of Claim 1, further comprising: a temperature-controlled (20; Figure 1; column 2, lines 35-58) top plate (7; Figure 1; column 2, lines 35-58) adjacent the first portion (top portion of through hole for 22; Figure 1; column 2, lines 35-58) of the apertures (T-shaped hole for 22; Figure 1; column 2, lines 35-58) of the first member (7; Figure 1; column 2, lines 34-58) and including a plurality of through openings (top portion of T-shaped hole for 22 - not labelled; Figure 1) each aligned with a respective aperture (T-shaped hole for 22; Figure 1; column 2, lines 35-58) in the first member (7; Figure 1; column 2, lines 34-58); and a plurality of second fastener members (“bolts 18”; Figure 1; column 2, lines 35-58) each engaged with a respective first fastener member (member between 7 and 22; Figure 1; column 2, lines 35-58) to secure the first member (7; Figure 1; column 2, lines 34-58) to the top plate (7; Figure 1; column 2, lines 35-58), as claimed by claim 4

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- vi. The component (Figure 1; column 1, line 55 - column 2, line 58) of Claim 4, wherein (i) each of the first fastener members (members between 7 and 22; Figure 1; column 2, lines 35-58) comprises internal threads, and each of the second fastener members ("bolts 18"; Figure 1; column 2, lines 35-58) comprises external threads engaged with the internal threads of a respective first fastener member (member between 7 and 22; Figure 1; column 2, lines 35-58), or (ii) each of the first fastener members (members between 7 and 22; Figure 1; column 2, lines 35-58) comprises external threads, and each of the second fastener members ("bolts 18"; Figure 1; column 2, lines 35-58) comprises internal threads engaged with the external threads of a respective first fastener member (member between 7 and 22; Figure 1; column 2, lines 35-58), as claimed by claim 9. It is inherent that Barnes' "bolts" have "a head and an externally threaded end portion opposite the head". And that Barnes' "bolts" have "first fastener members (members between 7 and 22; Figure 1; column 2, lines 35-58) comprises internal threads, and each of the second fastener members ("bolts 18"; Figure 1; column 2, lines 35-58) comprises external threads engaged with the internal threads of a respective first fastener member (member between 7 and 22; Figure 1; column 2, lines 35-58)".

Barnes further teaches:

- i. A showerhead (Figure 1) electrode (7; Figure 1) assembly for a plasma (abstract) processing apparatus (Figure 1), comprising; an electrode (7; Figure 1) having gas a injection opening (5; Figure 1); a backing member (1; Figure 1) secured to the electrode (7), the backing member (1; Figure 1) including a plurality of through apertures (T-shaped hole for 18; Figure 1; column 2, lines 35-58) each having a first portion (bottom



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portion of through hole for 18; Figure 1; column 2, lines 35-58) and a second portion (top portion of through hole for 18; Figure 1) wider than the first portion (bottom portion of through hole for 18; Figure 1); a top plate (7; Figure 1; column 2, lines 35-58) including a plurality of through openings (top portion of T-shaped hole for 18 - not labelled; Figure 1) each of which is aligned with a respective aperture (T-shaped hole for 18; Figure 1; column 2, lines 35-58) in the backing member (1; Figure 1); second fastener member (18; Figure 1) to secure the backing member (1; Figure 1) to the top plate (7; Figure 1; column 2, lines 35-58) – claim 17

- ii. second fastener members (“bolts 18”; Figure 1; column 2, lines 35-58) comprises external threads engaged with the internal threads of a respective first fastener member (member between 7 and 22; Figure 1; column 2, lines 35-58) – claim 21 It is inherent that Barnes’ “bolts” have “a head and an externally threaded end portion opposite the head” and are “second fastener members comprises external threads” – claim 21
- iii. T-nut first fastener members (members between 7 and 22; Figure 1; column 2, lines 35-58), as claimed by claim 27
- iv. The component of Claim 11, wherein the third part is a temperature-controlled top plate (8), as claimed by claim 28
- v. The showerhead electrode assembly of Claim 17, wherein the top plate (8) is adjacent the first portion of the apertures (T-shaped hole for 18; Figure 1; column 2, lines 35-58) of the backing member (1; Figure 1) and is temperature-controlled, as claimed by claim 29

Barnes does not teach:

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- i. Barnes' first member (7; Figure 1; column 2, lines 34-58) is bonded to Barnes' second member (1,8; Figure 1)
- ii. the bearing surface of each of the first fastener members (members between 7 and 22; Figure 1; column 2, lines 35-58) each include a head (top thickest portion of 22; Figure 1) bonded with an elastomer to the surface - claim 3
- iii. The component (Figure 1; column 1, line 55 - column 2, line 58) of Claim 1, wherein the first member (7; Figure 1; column 2, lines 34-58) comprises a plate made of graphite, and the second member (1,8; Figure 1) comprises a showerhead (top thickest portion of 22; Figure 1) electrode made of silicon, as claimed by claim 7
- iv. The component (Figure 1; column 1, line 55 - column 2, line 58) of Claim 1, wherein the second member (1,8; Figure 1) comprises an inner silicon electrode and a segmented outer silicon electrode, and the first member (7; Figure 1; column 2, lines 34-58) comprises a graphite backing plate secured to the inner silicon electrode and a graphite backing ring secured to the outer silicon electrode, as claimed by claim 8
- v. Barne's component (Figure 1; column 1, line 55 - column 2, line 58) of Barne's plasma processing apparatus (abstract), comprising: Barne's first part (3; Figure 1) including Barne's attachment surface (2/3 interface; Figure 1) and Barne's exposed surface (lowest surface of 3) adapted to be exposed to Barne's interior of Barne's plasma processing chamber (Abstract); Barne's second part (2; Figure 1) including Barne's first surface (Lowest Surface of 2; Figure 1) spaced from Barne's second surface (Top Surface of 2; Figure 1), Barne's first surface (Lowest Surface of 2; Figure 1) being bonded to Barne's attachment surface (2/3 interface; Figure 1) of Barne's first part (3; Figure 1), Barne's

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second part (2; Figure 1) including axially extending apertures (4) extending between Barne's first surface (Lowest Surface of 2; Figure 1) and Barne's second surface (Top Surface of 2; Figure 1), each of the apertures (4) including Barne's first portion opening in Barne's first surface (Lowest Surface of 2; Figure 1) and Barne's second portion opening in Barne's second surface (Top Surface of 2; Figure 1), Barne's first portion being wider in Barne's transverse direction than Barne's second portion; and fastener members located in Barne's second portions (top surface of 4) of Barne's apertures (4), as claimed 10

- vi. Barne's component (Figure 1; column 1, line 55 - column 2, line 58) of Claim 10, further comprising: Barne's third part (7) adjacent Barne's second surface (Top Surface of 2; Figure 1) of Barne's second part (2; Figure 1) and including through openings (holes in 2 accommodating "pins/studs" 4) aligned with Barne's apertures (4) in Barne's second part (2; Figure 1); and Barne's connectors ("pins/studs" 4) located in Barne's openings (holes in 2 accommodating "pins/studs" 4), the Barne's connectors ("pins/studs" 4) being detachably engaged with the fastener members such that Barne's third part (7) is detachable from Barne's second part (2; Figure 1), as claimed by claim 11
- vii. Barne's component (Figure 1; column 1, line 55 - column 2, line 58) of Claim 10, wherein Barne's first part (3; Figure 1) is Barne's showerhead electrode, and Barne's second part (2; Figure 1) is Barne's backing plate, as claimed by claim 12
- viii. Barne's component (Figure 1; column 1, line 55 - column 2, line 58) of Claim 11, wherein the fastener members are T-nuts, and the Barne's connectors ("pins/studs" 4) include external threads, as claimed by claim 13

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- ix. Barne's component (Figure 1; column 1, line 55 - column 2, line 58) of Claim 10, wherein Barne's second portions (top surface of 4) of Barne's apertures (4) comprise at least one load-bearing surface (top surface of "pins/studs" 4) extending in Barne's transverse direction, and the fastener members comprise at least one surface bonded to Barne's load-bearing surface (top surface of "pins/studs" 4), as claimed by claim 14
- x. Barne's component (Figure 1; column 1, line 55 - column 2, line 58) of Claim 10, wherein the fastener members are T-nuts, as claimed by claim 15
- xi. Barne's component (Figure 1; column 1, line 55 - column 2, line 58) of Claim 11, wherein Barne's first portions of Barne's apertures (4) are round holes having diameters larger than diameters of openings (holes in 2 accommodating "pins/studs" 4) in Barne's third part (7), as claimed by claim 16
- xii. a silicon electrode having gas injection openings – claim 17
- xiii. a graphite backing member (1; Figure 1) – claim 17
- xiv. a plurality of first fastener members, each first fastener member being mounted in a respective aperture (T-shaped hole for 18; Figure 1; column 2, lines 35-58) of the backing member (1; Figure 1), the first fastener member (member between 7 and 22; Figure 1; column 2, lines 35-58) including a bearing surface (lowest surface of widest portion of 22; Figure 1; column 2, lines 35-58) facing a surface at least partially defining the second portion (top portion of through hole for 18; Figure 1) of the apertures (T-shaped hole for 18; Figure 1; column 2, lines 35-58) – claim 17

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- xv. The showerhead electrode assembly of Claim 17, wherein the first fastener members each comprise a head adhesively bonded to the bearing surface of the aperture, and/or the first fastener members are T-nuts – claim 18
- xvi. The showerhead electrode assembly of Claim 17, wherein the second portion of each aperture is configured to prevent rotation of the first fastener member relative to the backing member (1; Figure 1) – claim 19
- xvii. The showerhead electrode assembly of Claim 17, wherein the silicon electrode comprises an inner member and a segmented outer member, and the backing member (1; Figure 1) comprises a backing plate secured to the inner member and a backing ring secured to the outer member – claim 20
- xviii. The showerhead electrode assembly of Claim 17, wherein (i) each of the first fastener members comprises internal threads, or (ii) each of the first fastener members comprises external threads - claim 21
- xix. The showerhead electrode assembly of Claim 17, wherein the backing member (1; Figure 1) comprises a first surface and a second surface opposite the first surface, the first surface is secured to the silicon electrode and the second surface is secured to the top plate (7; Figure 1; column 2, lines 35-58), as claimed by claim 30

Ishida teaches a similarly constructed plasma apparatus (Figure 1) and electrode (106; Figure 1, 3-5) including a plurality of first fastener members (109; Figures 3-4) with a first portion (Top of 109) being wider in transverse direction than a second portion (Bottom of 109). Ishida's first fastener members (109; Figures 3-4) each include a head (top thickest portion of 109; Figure 1) bonded with an elastomer (31a – "O-rings"; Figure 3; column 4, lines 23-28).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Ishida's first fastener members (109; Figures 3-4) to Barnes' apparatus and construct Barnes' electrode of silicon, having plural gas injection openings, and construct Barnes' backing member (1; Figure 1) of graphite.

Motivation to add Ishida's first fastener members (109; Figures 3-4) to Barnes' apparatus is for transferring heat among Ishida's component parts to avoid deformation as taught by Ishida (column 2; lines 39-46), and motivation to construct Barnes' a electrode of silicon, having plural gas injection openings, and construct Barnes' backing member (1; Figure 1) of graphite is for using plasma compliant materials as taught by Barnes (column 1; lines 9-21). Further, it is well established that the duplication of parts is obvious (In re Harza , 274 F.2d 669, 124 USPQ 378 (CCPA 1960) MPEP 2144.04). Further, it has been held that it is obvious to make whole elements seperable (In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961) – MPEP 2144.04.

***Allowable Subject Matter***

11. Claim 26 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter: The closest prior art to Ishida, Toshimichi et al. (US 5766364 A) does not teach or suggest that his first fastener members (109; Figures 3-4) are/should be "externally threaded".

***Response to Arguments***

13. Applicant's arguments with respect to claims 10-16 have been considered but are moot in view of the new grounds of rejection.

14. Applicant states that Applicant's "first member", "second member", "first part", "second part", "first surface", "second surface" are all detailed in pending drawings. The Examiner disagrees. Each of Applicant's claimed "first member", "second member", "first part", "second part", "first surface", "second surface" must have a figure number both in the specification and the drawings to be properly interpreted by Applicant's claims. See 37 CFR 1.83(a).

15. The remainder of applicant's arguments are moot in view of the new grounds of rejection.

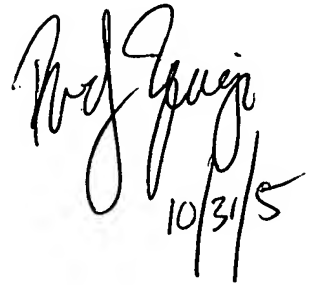
***Conclusion***

16. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272.1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (703) 872-9306. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.



Rudy Zervigon  
10/31/5